

Summary of 1998 Toxics Release Inventory (TRI) Data

Background

The Toxics Release Inventory (TRI) is a publicly available database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industries as well as by federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), which requires facilities to use their best readily available data to calculate their releases and waste management estimates. If facilities do not have actual monitoring data, submitted values are derived from various estimation techniques. There are now nearly 650 toxic chemicals and chemical compounds on the list of chemicals that must be reported to EPA and the States under the EPCRA/TRI Program.

A facility must report to TRI if it meets the following three criteria:

- Conducts manufacturing operations within Standard Industry Classification (SIC) codes 20 through 39 and, beginning in the 1998 reporting year, if it is in one of the following industry categories: metal mining, coal mining, electrical utilities, RCRA Subtitle C hazardous waste treatment and disposal facilities, chemicals distributors, petroleum terminals, and solvent recovery services; (Also, federal facilities must report to TRI regardless of their SIC code classification.)
- Employs 10 or more full-time equivalent employees;
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the reporting year.

1998 Data Release

The time period covered for the data released today is for reporting year 1998. A reporting year is equal to a calendar year. This 1998 data was submitted to EPA by July 1, 1999 and is the focus of the current data release. This report briefly summarizes the 1998 TRI data and trends in the data from 1988 to 1998, 1995 to 1998 and from 1997 to 1998. This report also describes assumptions made in the analysis and provides information on the uses as well as limits of the data. The full Public Data Release report and State Fact Sheet report will be complete in June, 2000.

1998 was the first year that seven “new” industries were required to report their releases and other waste management quantities to EPA under the TRI program. The seven new industries are metal mining, coal mining, electric utilities, chemicals distributors, petroleum bulk terminals, RCRA Subtitle C hazardous waste treatment and disposal facilities, and solvent recovery services. 1,957 of these new facilities reported to TRI in 1998.

The “old” or “original” industries that have been reporting to TRI since 1987 are facilities in the manufacturing sector. Manufacturing facilities are defined as facilities in Standard Industrial

Classification (SIC) Codes 20-39. Federal facilities, which have been required to report since 1994 regardless of their SIC code classification, are also included as an “old” or “original” industry. 21,439 of these original facilities reported to TRI in 1998.

1998 TRI Data (Original and New Industries)

In 1998, facilities reported a total of 7.3 billion pounds of releases to air, land, water and underground injection. The original industries reported approximately 2.4 billion pounds, or 32.6%, of the 7.3 billion pounds. These industries submitted 61,234 Form Rs and 10,840 Form As.¹ Facilities in the new sectors reported almost 4.9 billion pounds, or 67.4%, of the 7.3 billion pounds. The new industries submitted 12,567 Form Rs and 2,688 Form As.

On-site releases were 93.9 % (6.9 billion pounds) of the total releases in 1998. Of these on-site releases, 62.8 % were to land, 29.9 % were to air, 3.9 % were to underground injection, and 3.4 % were to surface water. Reporting from the new industries accounted for 91.7 % of the land releases on-site, 38.8% of the air releases, 21.2 % of the releases to underground injection wells, and 3.5% of the discharges to surface water.

Off-site releases were 6.1% (444 million pounds) of the total releases in 1998. Off-site releases result when a facility sends quantities of a toxic chemical to another facility, where they are then released. Of these off-site releases, 65.6 % (292 million pounds) were to landfills/surface impoundments.

Of the seven new sectors, two sectors (metal mining and electric utilities) accounted for 93.9% of the 4.9 billion pounds of total releases from these newly reporting industry sectors. The metal mining sector reported 3.5 billion pounds, or 71.2 %, of the 4.9 billion pounds. On-site releases were 99.97 % of the metal mining sector’s total releases and 98.9% of these on-site releases were to land.

Metal mines move, store and dispose of very large volumes of heavy metals which are components of waste rock and tailings. In order to get at an ore body, some mines must remove a large amount of submarginal ore, or waste rock, and dispose of it. This material may contain small amounts of various heavy metals, and if reporting thresholds are exceeded elsewhere in the facility, the amount of these TRI-listed chemicals that are disposed must be reported. All metals originally occurred naturally. However, these metals are on the TRI list because they are known to cause human health and/or environmental toxicity. The previously buried metals in waste rock are exposed to the elements upon excavation and become susceptible to leaching by rain and snow. Unless carefully controlled and monitored, the leaching process can lead to ground and surface water sources contaminated with heavy metals and other toxic chemical pollution that would not

¹The Form R is the reporting form that must be annually submitted by the facility. Facilities report the amounts of toxic chemicals released on- or off-site to air, land, water, underground injection; the amounts transferred off-site for recycling, energy recovery, treatment, and disposal; and the amounts recycled, burned for energy recovery, or treated at the facility. A facility can report using a Form A if the facility does not exceed the total production-related waste amount of 500 pounds, and does not manufacture, process, or otherwise use more than 1 million pounds of the chemical. Instead of filing a Form R detailing all its releases and waste management activities, the facility can submit a certification statement (Form A).

have occurred naturally. Significant factors are the chemistry of the rock, particle size, precipitation rates, and most importantly, a mine's operating and waste management practices. Some mines also produce tailings, which is the processed rock that remains after the target metal is extracted from the ore. Tailings often contain various other metals, such as chromium and copper. Under TRI Regulations, mines are required to report the metal compounds contained in the tailings when the rock is disposed of.

The electric utility sector (SIC code 49) reported 1.1 billion pounds of releases, or 22.7%, of the 4.9 billion pounds of the releases from the new industries. On-site releases were 94.4% of the electric utility sector's total releases and 74.3% of these on-site releases were to the air. Most of the releases from electric utilities are the result of burning coal or oil to generate electricity. (Note: Only coal-fired and oil-fired electric utilities are required to report to TRI.) Both coal and oil contain metals that are released to the air when the fuel is combusted. These metals include barium, copper, chromium, manganese, lead, nickel and zinc. Other chemicals formed during combustion include hydrochloric acid, sulfuric acid, and hydrogen fluoride. The ash that remains after coal is combusted will also contain metals. Large quantities of this ash may be disposed of in on- or off-site landfills, or returned to coal mines for disposal there.

The sector made up of RCRA Subtitle C hazardous waste treatment and disposal facilities (SIC code 4953) and solvent recovery facilities (SIC code 7389) reported 282 million pounds, or 5.7 % of the 4.9 billion pounds of releases from the new industries. Since many of the facilities in these two SIC codes are co-located and the activities are closely related, their releases were aggregated for this analysis. Hazardous waste treatment facilities handle large quantities of materials which may contain heavy metals, asbestos, and other chemicals. (Note: The reporting requirements apply only to those facilities regulated by subtitle C of RCRA.) Solvent recovery services collect, recycle, and redistribute solvents. On-site releases made up 83.0 % of this sector's total releases and 84.0% of these on-site releases were to landfills permitted under RCRA subtitle C.

In terms of reporting from the original (manufacturing sector) industries, the top 3 sectors for total releases are the chemical manufacturing sector (SIC code 28), the primary metals sector (SIC code 33), and the paper sector (SIC code 26). The chemical manufacturing sector (SIC code 28) reported 739 million pounds of total releases, or 31.1%, of the 2.4 billion pounds reported by the original industries. 94.4 % of the 739 million pounds were on-site releases and 46.2 % of those on-site releases were to air and 29.6% were to Class I underground injection wells. The primary metals sector (SIC code 33) reported 614 million pounds of total releases, or 25.8%, of the 2.4 billion pounds reported by the original industries. On-site releases made up 68.6% of the 614 million pounds of total releases and 31.4% were off-site releases. Of the on-site releases, 58.0% were to land, 29.0% were to air, and 12.8% were to surface water. The paper sector (SIC code 26) reported 230 million pounds of total releases, or 9.7%, of the 2.4 billion pounds reported by the original industries. On-site releases were 97.9% of the 230 million pounds of total releases and 82.7% of those on-site releases were to air and 9.7% were to surface water.

Trend Data

Year-to-year comparisons must be based on a consistent set of chemicals and reporting industries to assure that any changes in releases or other waste management do not simply reflect changes in reporting requirements from one year to another. Since the seven new industries just began reporting in 1998, the year-to-year comparisons below only include the original industries that have been required to report to TRI since the program began in 1987. The trend comparisons for 1997 to 1998 and 1995 to 1998 include only chemicals that were reportable in all years from 1995 through 1998. The trend comparison for 1988 to 1998 includes only chemicals that were reportable in all years from 1988 through 1998.

1997-1998 TRI Data

Overall, between 1997 and 1998, total releases (including both on-site and off-site releases) decreased approximately 3.5% or 90 million pounds. On-site releases decreased 4% or 85 million pounds and off-site releases decreased 1.2% or 6 million pounds. At the same time, total forms submitted decreased 1.4% and total facilities decreased 1.9% (410 fewer facilities reported in 1998 compared to 1997).

Of the four on-site release categories, two decreased and two increased. Air releases decreased 6% or 80 million pounds, and underground injection decreased 5% or 11 million pounds. Surface water discharges increased 0.5% or 1 million pounds, and on-site land releases increased 1.5% or 5 million pounds.

1995-1998 TRI Data

Overall, between 1995 and 1998, total releases (including both on-site and off-site releases) decreased approximately 5% or 141 million pounds. On-site releases decreased 12%, or 274 million pounds; while off-site releases increased 42% or 134 million pounds. At the same time, total forms submitted decreased 5.3% and total facilities decreased 5.9% (1,342 fewer facilities reported in 1998 compared to 1995).

Of the four on-site release categories, two decreased and two increased. Air releases decreased 21% or 328 million pounds, and underground injection decreased 11% or 26 million pounds. Surface water discharges increased 24% or 43 million pounds, and on-site land releases increased 11% or 36 million pounds.

1988-1998 TRI Data

Overall, on- and off-site releases have decreased 1.5 billion pounds or 45% since 1988. On-site releases substantially decreased with air releases making up 1.3 billion pounds of the 1.5 billion pound total decrease in on-site releases. Off-site releases increased 2.0 million pounds or 0.5%. In terms of absolute amounts, four categories made up most of the off-site releases: solidification/stabilization (metals and metal compounds), landfills/disposal surface impoundments, other off-site management, and transfers to waste broker for disposal. In terms of

the change in off-site releases from 1988 to 1998, solidification/stabilization (metals and metal compounds) increased 107 million pounds and was off-set by decreases in three categories including landfills/disposal surface impoundments, other off-site management, and transfers to waste broker for disposal (decreases of 44 million pounds, 31 million pounds, 18 million pounds, respectively).

Understanding the Uses, Scope and Limits of TRI Data

The TRI Program has given the public unprecedented direct access to toxic chemical release and other waste management data at the local, state, regional, and national level. Responsible use of this information can enable the public to identify potential concerns, gain a better understanding of potential risks, and work with industry and government to reduce toxic chemical releases and the risks associated with them. When combined with hazard and exposure data, this information can allow informed environmental priority-setting at the local level.

Federal, state, and local governments can use the data to compare facilities or geographic areas, to identify hot spots, to evaluate existing environmental programs, to more effectively set regulatory priorities, and to track pollution control and waste reduction progress. TRI data, in conjunction with demographic data, can help government agencies and the public identify potential environmental justice concerns.

In addition, industry can use the data to obtain an overview of the release and other waste management of toxic chemicals, to identify and reduce costs associated with toxic chemicals in waste, to identify promising areas of pollution prevention, to establish reduction targets, and to measure and document progress toward reduction goals. Public availability of the data has prompted many facilities to work with communities to develop effective strategies for reducing environmental and human health risks posed by toxic chemical releases.

While TRI provides the public, industry, and state and local governments an invaluable source of key environmental data, it has some limitations that must be considered when using the data. First, users of TRI information should be aware that TRI data reflect releases and other waste management of chemicals, not exposures of the public to those chemicals. Release estimates alone are not sufficient to determine exposure or to calculate potential adverse effects on human health and the environment. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities of toxic chemicals.

Also, TRI data are only collected from certain industrial sectors. These include the manufacturing sector (SIC codes 20-39), metal mining, coal mining, electric utilities, petroleum bulk terminals, chemicals wholesalers, RCRA commercial hazardous waste treatment, and solvent recovery. Federal facilities also report to TRI regardless of their SIC classification. Although TRI is successful in capturing information on a significant portion of toxic chemicals currently being used by covered industry sectors, it does not cover all toxic chemicals or all industry sectors. For instance, TRI does not include toxic emissions from cars and trucks, nor from the majority of sources of releases of pesticides, volatile organic compounds, fertilizers and many other non-

industrial sources. In addition, facilities that do not meet the TRI threshold levels (for manufacturing/processing or otherwise using or for number of employees) are not required to report.

Another limitation of the existing TRI program is that the data currently collected provide limited information on the life cycle of chemicals used by facilities. Beyond reporting on releases and other waste management, only limited and very general information on chemicals storage is provided and none on the toxicity of the chemicals.

Furthermore, facilities report estimated data to TRI, and the program does not mandate that they monitor their releases. Various estimation techniques are used when monitoring data are not available, and EPA has published estimation guidance for the regulated community. Variations between facilities can result from the use of different estimation methodologies. These factors should be taken into account when considering data accuracy and comparability.

Finally, the TRI report alone does not indicate whether a facility's chemical releases are legal. These releases must be compared with applicable permits to evaluate whether the facility is in compliance with other environmental regulations. Many of the releases included in the TRI report are permitted by EPA and State Regulatory Agencies.

Assumptions in Analysis

1998 was the first year that EPA collected information from the commercial hazardous waste treatment sector. In the analysis of this year's data, EPA has taken steps to adjust for possible double counting of some releases in TRI now that EPA collects information from this sector. The potential for double counting arises because some manufacturing facilities report transfers of chemicals to other facilities that may then report the release of these chemicals. TRI facilities transfer off-site chemicals in waste to other facilities for disposal. These other facilities can dispose of the wastes in on-site landfills, disposal surface impoundments, in land treatment facilities, other types of land disposal, and underground injection wells or, if metals are sent to a wastewater treatment facility, they may be discharged to surface waters. These other facilities generally are treatment, storage and disposal (TSD) facilities regulated under the federal Resource Conservation and Recovery Act (RCRA). As mentioned above, such facilities are in one of the new industries required to report to TRI for the first time in the 1998 reporting year.

To avoid counting the transfers to the TSD facilities that are also reported to TRI as on-site releases by the TSD facilities, off-site transfers for disposal to these TSD facilities have been omitted from tables that compare or summarize on-site and off-site releases nationally or at a state level. Only the on-site releases from the TSD facilities have been included. The attached tables contain a note at the bottom of the table if transfers were omitted for that particular table. In

general, these transfers were omitted if the data were being analyzed from a national or state perspective.²

In addition to the double counting adjustment described above, EPA reclassified reporting for metals and metal compounds in this analysis in an effort to correct facility reporting errors. EPA requires the transfer of metals and metal compounds for further waste management be reported as either a transfer to recycling or a transfer to disposal (due to the fact that metal has no heat value and thus can not be combusted for energy recovery and can not be treated because it can not be destroyed). Two new disposal codes were added to the TRI reporting form in 1997 to provide more accurate reporting, codes M41 (solidification/stabilization–metals and metal compounds) and M62 (wastewater treatment (excluding POTWs)–metals and metal compounds). A number of facilities incorrectly reported the waste management of metals and metal compounds in 1998. These chemicals were incorrectly reported under codes M40 or M61, as being treated. In order to account for this error, EPA included metals and metal compounds that were incorrectly reported in the waste treatment categories in the corresponding disposal categories for metals and metal compounds instead. In order to compare data across reporting years, EPA made similar adjustments for prior years in tables that compared 1997 or 1998 data to earlier years of data.

Accessing the TRI data

You may access the TRI data through a number of web-based tools by going to the EPA's TRI home page at <http://www.epa.gov/tri>. The TRI home page also includes other background information on the TRI program and TRI data as well as information on applicable statutes, regulations, and guidance.

²Conducting this exercise required that EPA match amounts transferred to TSD facilities with amounts reported by these TSD facilities by using the reported RCRA ID number. In some cases, these RCRA ID numbers were not reported correctly by the facility so there are some quantities that cannot be matched and, therefore, these quantities could not be omitted from the analysis.